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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,647

11/27/2006

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BHJ15USA

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EXAMINER

OLSEN, ALLAN W

ART UNIT

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1792

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/551,647	<b>Applicant(s)</b> BUCKLEY ET AL.	
	<b>Examiner</b> Allan Olsen	<b>Art Unit</b> 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 13-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 13-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Specification*

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 15 requires ions of a normally inert gas to be chemically reactive with the organic material. Claim 16 further limits the inert gas to be that of argon.

*Claim 14 (new): A method according to claim 13, wherein the ions are chemically reactive with the organic material to be etched.*

*Claim 15 (new): A method according to claim 14, wherein the ions are ions of a normally inert gas.*

*Claim 16 (new): A method according to claim 15, wherein the ions are Argon ions.*

In this regard the specification states:

*The ions may be chemically reactive with the organic material to be etched in order to selectively etch the material and increase etch rate. The ions may be ions of a normally inert gas such as Argon.*

The specification sets forth two conditions:

- 1) the ions may be chemically reactive; and,
- 2) the ions may be ions of a normally inert gas such as argon.

However, the specification does not establish that these two conditions are simultaneously met. The examiner notes that argon ions are known to be useful in

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physically etching a material (i.e., sputtering) but they are not know for their ability to chemically react with organic material being etched.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 15-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification fails to enable a process in which ions of a normally inert gas become chemically reactive with an organic material.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1, 2 and 13-30 rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,214,631 issued to Burrows et al. (hereinafter, Burrows) in view of JP 01163704 (hereinafter, Miura).**

Burrows teaches a method of making organic light emitting diodes (OLED). Burrows teaches the patterning the layers by etching through a shadow mask (column 11, lines 29-42). Burrows teaches using reactive ions to etch. By virtue of the surface contours that would develop as Burrows carries out his method (see, for example, column 4, lines 14-30 and figure 4) the substrate is considered to have recesses therein that face the shadow mask.

Burrows does not teach using a reactive ion beam to etch. Burrows does not teach using an argon ion beam to etch.

Miura teaches ion beam etching of an organic polymer through a shadow mask.

It would have been obvious to one skilled in the art to use the reactive ion beam of Miura to etch the organic light emitting material of Burrows because the skilled artisan would readily appreciate that the reactive ion etching and the reactive ion beam etching techniques are readily interchangeable and Miura demonstrates that the directional nature of the ion beam makes the ion beam method particularly well suited for use in conjunction with a shadow mask. It would have been obvious to one skilled in the art to include argon ions in the plasma beam because Ar is typically used to contribute a sputtering component to an ion beam etching process.

Regarding claims 17 and 25, Burrows and Miura do not teach applying the beam of ions in a chamber having dimensions, at a pressure at which the mean free path of the ions is greater than or equivalent to the chamber dimensions.

It would have been obvious to one skilled in the art to use a pressure that provides the ions a mean free path that is greater than the chamber dimensions because this would minimize extraneous collisions and provide a more uniform ion beam.

Regarding claims 18 and 26, Burrows and Miura do not teach that the step of applying the beam of ions is carried out at a pressure less than  $5 \times 10^{-4}$  mbar.

It would be obvious to one skilled in the art to optimize the vacuum conditions of the process.

Regarding claims 19, 20 and 27-29, it is noted that the Burrows disclosure is largely focused on the use of shadow masks in conjunction with deposition processes. In this regard Burrows teaches using a shadow mask to deposit an organic layer of an array of organic light emitting diodes on the substrate and using a shadow mask to deposit organic material around the bond pad region. Nevertheless, Burrows clearly teaches that a subtractive process (etching), rather than an additive process (deposition) can be used (column 11, lines 29-42). In so doing Burrows makes obvious what is essentially the inverse process detailed by Burrows. For example, given Burrows' use of the shadow mask to shield the contact pad during deposition of the organic layer, the inverse process becomes obvious, that is, to use the shadow mask in conjunction with an etching process to remove organic material from the contact pad.

Regarding claim 30, Burrows teaches that current flows through the organic material used to make the SOLEDs therefore they are considered to be electrically conducting (see column 4, lines 47-50).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 571-272-1441. The examiner can normally be reached on M, W and F: 1-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Allan Olsen/  
Primary Examiner, Art Unit 1792